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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/917,633	07/31/2001	Shunpei Yamazaki	740756-2345	3382
22204 7590 08/28/2009 NIXON PEABODY, LLP 401 9TH STREET, NW SUITE 900 WASHINGTON, DC 20004-2128				
EXAMINER				
TRAN, THIEN F				
ART UNIT		PAPER NUMBER		
2895				
MAIL DATE		DELIVERY MODE		
08/28/2009		PAPER		

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

09/917,633

Applicant(s)

YAMAZAKI ET AL.

Examiner

Thien F. Tran

Art Unit

2895

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 20 May 2009.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 6 and 14-32 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 6 and 14-32 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Priority

Applicant's claim for the benefit of a prior-filed application under 35 U.S.C. 119(e) or under 35 U.S.C. 120, 121, or 365(c) is acknowledged. Applicant has not complied with one or more conditions for receiving the benefit of an earlier filing date under 35 U.S.C. 120, 121 as follows:

The later-filed application must be an application for a patent for an invention which is also disclosed in the prior application (the parent or original nonprovisional application or provisional application). The disclosure of the invention in the parent application and in the later-filed application must be sufficient to comply with the requirements of the first paragraph of 35 U.S.C. 112. See *Transco Products, Inc. v. Performance Contracting, Inc.*, 38 F.3d 551, 32 USPQ2d 1077 (Fed. Cir. 1994).

The disclosure of the prior-filed application, Application No. 09/848,307, fails to provide adequate support or enablement in the manner provided by the first paragraph of 35 U.S.C. 112 for one or more claims of this application. The limitations "the second crystalline portion is a region where a metal was directly added", "the second crystalline portion has a surface through which a metal is added", "a third crystalline portion between the channel region and the first crystalline portion" in claims 6, 14-17, 21, 25, and 29 claim additional disclosure not presented in the prior application. These specific features are not disclosed and defined any where in the prior application that would permit one skilled in the art to immediately envisage the product as claimed. Accordingly, claims 6, 14-32 are not entitled to the benefit of the prior application.

This application repeats a substantial portion of prior Application No. 09/848,307, filed 05/04/2001, and adds and claims additional disclosure not presented in the prior application. Since this application names an inventor or inventors named in the prior application, it may constitute a continuation-in-part of the prior application. Should applicant desire to obtain the benefit of the filing date of the prior application, attention is directed to 35 U.S.C. 120 and 37 CFR 1.78.

Applicant states that this application is a continuation or divisional application of the prior-filed application. A continuation or divisional application cannot include new matter. Applicant is required to change the relationship (continuation or divisional application) to continuation-in-part because this application contains the following matter not disclosed in the prior-filed application: the limitations "the second crystalline portion is a region where a metal was directly added" in claims 6 and 15, "the second crystalline portion has a surface through which a metal is added" in claims 14 and 16, and "a third crystalline portion between the channel region and the first crystalline portion" in claims 17, 21, 25 and 29.

Drawings

The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, "the second crystalline portion is a region where a metal was directly added", "the second crystalline portion has a surface through which a metal is added", and "a third crystalline portion between the channel region and the first crystalline portion" must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 6, 14-32 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed,

had possession of the claimed invention. The recitation of "the second crystalline portion is a region where a metal was directly added" in claim 6 and claim 15 sets forth a structure not supported by the disclosure as original filed. The specification does not provide a description of the formation of the second crystalline portion where a metal was directly added. Indeed, Fig. 1B and the specification only disclose metal films (17A, 17B) formed on the impurity source/drain regions (16A, 16B). The portions of the impurity regions (16A, 16B) directly under the metal films (17A, 17B) are considered by the examiner as the second crystalline portion because the specification does not explicitly disclose a first crystalline portion as well as a second crystalline portion. It is evident that the disclosed metal (17A, 17B) on the second crystalline portion (16A, 16B) is not the same as a claimed second crystalline portion where a metal was directly added. The pages and lines pointed out by applicant do not provide support for the new limitations added into the claims. Applicant has failed to point out exactly wherein the specification that expressly discloses that a metal was directly added to the second crystalline portion as claimed. Also, in the final structure, the metal films were removed and replaced by the wiring electrodes (19A, 19B). As such, no metal was directly added to the second crystalline portion as claimed, and the metal is an intermediate feature formed on the source/drain regions to help crystallization of the regions (16A, 16B) and was not present in the final structure.

The recitation of "the second crystalline portion has a surface through which a metal is added" in claim 14 and claim 16 sets forth a structure not supported by the disclosure as original filed. The specification does not provide a description of the

formation of the second crystalline portion having a surface through which a metal is added. Indeed, Fig. 1B and the specification only disclose metal films (17A, 17B) formed on the impurity source/drain regions (16A, 16B). The portions of the impurity regions (16A, 16B) directly under the metal films (17A, 17B) are crystallized and are considered by the examiner as the second crystalline portion because the specification does not expressly disclose a second crystalline portion. It is evident that the disclosed metal on the second crystalline portion is not the same as a claimed second crystalline portion having a surface through which a metal is added. Applicant has failed to point out exactly wherein the specification that expressly discloses the second crystalline portion having a surface through which a metal is added as claimed. Also, in the final structure, the metal films were removed and replaced by the wiring electrodes (19A, 19B). As such, no metal is added to the second crystalline portion as claimed; and the metal is an intermediate feature to help crystallization of the regions (16A, 16B) and was not present in the final structure.

The recitation of "a third crystalline portion between the channel region and the first crystalline portion" in claim 17, claim 21, claim 25, and claim 29 sets forth a structure not supported by the disclosure as original filed. The specification does not provide a description of the formation of a third crystalline portion between the channel region and the first crystalline portion. Applicant is requested to point out exactly wherein the specification that expressly discloses a third crystalline portion between the channel region and the first crystalline portion. Furthermore, the examiner is not able to

identify what element in the drawings is a third crystalline portion. So, applicant is requested to identify the claimed subject matter in the drawings.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 6, 14-17, 19-21, 23-25, 27-29, 31 and 32, insofar as in compliance with 35 USC 112, are rejected under 35 U.S.C. 102(b) as being anticipated by Joo et al. (US 6,097,037).

Regarding claims 6, 14, 15 and 16, Joo et al discloses a transistor (Figs. 5D) comprising: a channel region (51C); at least one of a source region (51S) and a drain region (51D) having a first crystalline portion (56) adjacent to the channel region and a second crystalline portion (57) adjacent to the first crystalline portion, wherein the second crystalline portion is a region where a metal (54) was formed on, wherein the first crystalline portion is a region where crystallization advanced from the second crystalline portion, and wherein a crystal of the first crystalline portion is a crystal which grew in a horizontal direction from the second crystalline portion.

Regarding claims 17, 21, 25 and 29, Joo et al further discloses a gate insulating film (52); and a gate electrode (53) adjacent to the channel region (51C) with the gate insulating film (52) interposed therebetween. The examiner does not consider a third

crystalline portion for lack of support in the disclosure. Also, this new element has been rejected under 112, 1st paragraph rejection for new matter.

Regarding claims 19-20, 23-24, 27-28, 31 and 32, the metal is nickel.

Claims 6, 14-32, insofar as in compliance with 35 USC 112, are rejected under 35 U.S.C. 102(b) as being anticipated by Hideaki Oka (JP 02-140915).

Regarding claim 6, 14, 15 and 16, Oka discloses a transistor (Figures 1a-d) comprising: a channel region; and at least one of a source region (107) and a drain region (107) of crystalline material. Oka does not explicitly disclose the source region or drain region having a first crystalline portion and a second crystalline portion. However, both crystalline portions of the claimed structure are formed of the same material and together they form a continuous source region or drain region. Therefore, they are essentially indistinguishable from each other as they form an integral part of the source region or drain region. Oka discloses the same crystalline source/drain region (107) that the examiner characterizes as comprising two portions, a portion of the source/drain region (107) between the channel and the wiring (111) as a first crystalline portion and another portion of the source/drain region (107) under the wiring (111) as a second crystalline portion. The limitations "the second crystalline portion is a region where a metal was directly added" in claims 6 and 15 and "the second crystalline portion has a surface through which a metal is added" in claims 14 and 16 are not considered for lack of support in the disclosure and are rejected under 112, 1st paragraph.

The claim limitations "the first crystalline portion is a region where crystallization advanced from the second crystalline portion" in claims 6, 14-16 and "grew in a horizontal direction from the second crystalline portion" in claims 15-16 are taken to be product by process limitations. A product by process claim directed to the product per se, no matter how actually made, In re Hirao, 190 USPQ 15 at 17 (footnote 3). See In re Fessman, 180 USPQ 324, 326 (CCPA 1974); In re Marosi et al., 218 USPQ 289, 292 (Fed. Cir. 1983); and particularly In re Thorpe, 227 USPQ 964, 966 (Fed. Cir. 1985), all of which make it clear that it is the patentability of the final structure of the product "gleaned" from the process steps, which must be determined in a "product by process" claim, and not the patentability of the process. See also MPEP 2113. Moreover, an old and obvious product produced by a new method is not a patentable product, whether claimed in "product by process" claims or not. In the final product, the first crystalline portion and the second crystalline portion are crystalline regions having the same characteristics and together they form an integrated source region or drain region (16A or 16B). Oka discloses the same structure having an integrated source region or drain region (107) wherein the source region or the drain region each has two crystalline portions that read on the claim.

Regarding claims 17, 21, 25 and 29, Oka further discloses a gate insulating film (108); and a gate electrode (106) adjacent to the channel region with the gate insulating film (108) interposed therebetween. The examiner does not consider a third crystalline portion for lack of support in the disclosure. This new element has been addressed and rejected under 112, 1st paragraph for new matter.

Regarding claims 18, 22, 26 and 30, Oka also discloses a gate insulating film (108) over the channel region, the first crystalline portion, and the second crystalline portion, wherein the gate insulating film has an opening overlapping with the second crystalline portion.

Regarding claims 19-20, 23-24, 27-28, 31 and 32, these claims claim a transistor (a final product) not an intermediate structure. In the final claimed structure (see Fig. 1C in the present invention), the metal (17A, 17B) as an intermediate element shown in Fig. 1B has been removed and replaced by a wiring electrode (19A, 19B). Thus, the limitations "the metal is nickel" in claims 19, 23, 27 and 31, and "the metal is at least one from the group consisting of nickel, iron, cobalt, platinum, and palladium" in claims 20, 24, 28 and 32 are taken to be product by process limitations. A product by process claim directed to the product per se, no matter how actually made, In re Hirao, 190 USPQ 15 at 17 (footnote 3). See In re Fessman, 180 USPQ 324, 326 (CCPA 1974); In re Marosi et al., 218 USPQ 289, 292 (Fed. Cir. 1983); and particularly In re Thorpe, 227 USPQ 964, 966 (Fed. Cir. 1985), all of which make it clear that it is the patentability of the final structure of the product "gleaned" from the process steps, which must be determined in a "product by process" claim, and not the patentability of the process. See also MPEP 2113. Moreover, an old and obvious product produced by a new method is not a patentable product, whether claimed in "product by process" claims or not.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 19-20, 23-24, 27-28, 31 and 32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hideaki Oka (JP 02-140915) in view of Joo et al (US 6,097,037).

Regarding claims 19-20, 23-24, 27-28, 31 and 32, Oka does not disclose that the metal is nickel. However, it is old in the art to form nickel on a semiconductor layer to help crystallizing the semiconductor layer as taught by Joo et al. Therefore, using nickel would have been obvious modification.

Claims 18, 22, 26 and 30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Joo et al (US 6,097,037) in view of Hideaki Oka (JP 02-140915).

Regarding claims 18, 22, 26 and 30, Joo et al. does not disclose a gate insulating film over the channel region, the first crystalline portion, and the second crystalline portion, wherein the gate insulating film has an opening overlapping with the second crystalline portion. Oka as described above discloses a gate insulating film (108) over the channel region, the first crystalline portion, and the second crystalline portion, wherein the gate insulating film has an opening overlapping with the second crystalline portion (see Fig. 1d). It would have been obvious to a person having ordinary skill in the art at the time the invention was made to form the gate insulating film over the channel region, the first crystalline portion, and the second crystalline portion, wherein the gate insulating film has an opening overlapping with the second crystalline portion as taught by Oka in order to insulate and protect the channel region, the first and second

crystalline portions from moisture, contaminants as well as from being shorted to the gate electrode.

Response to Arguments

Applicant's arguments with respect to claims 6 and 14-32 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Thien F. Tran whose telephone number is (571) 272-1665. The examiner can normally be reached on 7:30AM - 4:00PM Monday through Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Drew N. Richards can be reached on (571) 272-1736. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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Primary Examiner
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